

## ABSTRACT

A lightning detection system provides an estimated location of a lightning stroke. The system includes sensors and an analyzer. Each sensor within range of a lightning event provides messages to the analyzer. Each sensor includes a waveform engine that converts a signal received from the lightning event to a series of frequency domain components having respective magnitude and phase. The waveform engine adjusts magnitudes and phases of the frequency components, for example, to mitigate the effects of terrain conductivity where the received signal traveled across terrain. The adjusted frequency components are then converted by the waveform engine into a second time domain signal that is described in a message to the analyzer. Each message includes sensor identification, peak amplitude, and time of detecting the lightning event. The analyzer provides an estimated location of the lightning stroke and an estimated peak current of the lightning stroke in accordance with messages received from sensors.